IN THE CLAIMS:

Please cancel claims 1-53 and replace them with the following claims:

54. In the method for producing for external use a gaseous ammonia-containing product from urea, or mixtures of urea containing biuret and/or ammonium carbamate, said ammonia-containing product being essentially free of urea, biuret, or ammonium carbamate, the method comprising;

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at temperatures and pressures sufficient to produce a gaseous product stream of ammonia, carbon dioxide and water at a rate sufficient for external use in step d), and a residual liquid phase reaction medium containing unreacted urea, biuret and/or ammonium carbamate;

b) separating the gaseous product stream at a controlled pressure and flow rate;

c) retaining the liquid phase reaction medium in the reactor for further conversion to gaseous ammonia and carbon dioxide, and/or recycling at least a portion of the liquid phase reaction medium back into the reactor or a urea dissolver; and

d) withdrawing the gaseous ammonia containing product stream and feeding it at a controlled pressure and rate of flow for said external use;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

55. In the method for producing for external use a gaseous ammonia-containing product from urea, or mixtures of urea containing biuret and/or ammonium carbamate, said ammonia-containing product being essentially free of urea, biuret, or ammonium carbamate, the method comprising;

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at temperatures and pressures sufficient to produce a gaseous product stream of ammonia, carbon dioxide and water at a rate sufficient for external use in step d), and a residual liquid phase reaction medium containing unreacted urea, biuret and/or ammonium carbamate;

b) separating the gaseous product stream at a controlled pressure and flow rate while maintaining its temperature above 60°C.;

c) retaining the liquid phase reaction medium in the reactor for further conversion to gaseous ammonia and carbon dioxide, and/or recycling at least a portion of the liquid phase reaction medium back into the reactor or a urea dissolver; and

d) withdrawing the gaseous ammonia and carbon dioxide-containing product stream and feeding it, while maintaining its temperature above 60°C, for external use at a controlled pressure and controlled rate which is approximately the amount necessary to meet the demand of said external use;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor..

56. In the method adapted to provide a pressurized gas stream for an external

use in removing nitrogen oxides from a combustion gas stream by SNCR (Selective Non-Catalytic Reduction), or SCR (Selective Catalytic Reduction), the method comprising:

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein under pressures of about 20 - 500 psig to produce: (i) a gaseous product stream of ammonia, carbon dioxide and water sufficient for the external use in step d), and (ii) a residual liquid phase reaction medium;

b) separating the gaseous product stream from said residual liquid phase medium;

c) retaining the residual liquid phase medium in the reactor and/or recycling at least a portion of the residual liquid phase medium back into the reactor or a urea dissolver; and

d) feeding the separated gaseous product and stream for the external use at a controlled rate which is approximately the amount necessary to the demand of said external use in removing said nitrogen oxides;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor..

57. In the method adapted to provide a pressurized gas stream for an external use in removing nitrogen oxides from a combustion gas stream by SNCR (Selective Non-Catalytic Reduction), or SCR (Selective Catalytic Reduction), the method comprising:

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein under pressures of about 20 - 500 psig and at temperatures sufficient to produce: (i) a gaseous product stream of ammonia, carbon dioxide and water sufficient for the external use in step d), the temperature being in the range of at least 110° C up to about 300° C, and (ii) a residual liquid phase medium;

b) separating the gaseous product stream from said residual liquid phase medium;

c) retaining the residual liquid phase medium in the reactor and/or recycling at least a portion of the residual liquid phase medium back into the reactor or a urea dissolver; and

d) feeding the separated gaseous product and stream for the external use at a controlled rate which is approximately the amount necessary to the demand of said external use in removing said nitrogen oxides;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

58. In the method adapted to provide a pressurized gas stream for an external use in removing nitrogen oxides from a combustion gas stream by SNCR (Selective Non-Catalytic Reduction), or SCR (Selective Catalytic Reduction), the method comprising:

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at

temperatures and pressures sufficient to produce: (i) a gaseous product stream of ammonia, carbon dioxide and water sufficient for the external use in step d), the pressure being in the range of about 20-500 psig, and (ii) a residual liquid phase medium;

b) separating the gaseous product stream from said residual liquid phase medium;

c) retaining the residual liquid phase medium in the reactor and/or recycling at least a portion of the residual liquid phase medium back into the reactor or a urea dissolver; and

d) feeding the separated gaseous product and stream for the external use at a controlled rate which is approximately the amount necessary to the demand of said external use in removing said nitrogen oxides;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

59. In the method adapted to provide a pressurized gas stream for an external use in a combustion gas stream by SNCR (Selective Non-Catalytic Reduction), or SCR (Selective Catalytic Reduction), the method comprising:

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein under pressures of about 20 - 500 psig and at temperature sufficient to produce: (i) a gaseous product stream of ammonia, carbon dioxide and water sufficient for external use in step d), the solids content of said aqueous solution being from about 1% to 76% by weight,

and (ii) a residual liquid phase medium;

b) separating the gaseous product stream from said residual liquid phase reaction medium;

c) retaining the residual liquid phase reaction medium in the reactor and/or recycling at least a portion of the residual liquid phase medium back into the reactor or a urea dissolver; and

d) feeding the separated gaseous product and stream for the external use at a controlled rate which is approximately the amount necessary to the demand of said external use in removing said nitrogen oxides;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

60. In the method adapted to provide a pressurized gas stream for an external use, the method comprising:

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at pressures of about 20 - 500 psig and at temperature sufficient to produce: (i) a gaseous product stream of ammonia, carbon dioxide and water sufficient for the external use in step d), the rate of ammonia production being controlled by the concentration of urea in the reactor, the solids content of said aqueous solution being from about 1% to 76% by weight, and (ii) a residual liquid phase medium;

b) separating the gaseous product stream from said residual liquid phase medium;

c) retaining the residual liquid phase medium in the reactor, and/or recycling at least a portion of the residual liquid phase medium back into the reactor or a urea dissolver; and

d) feeding the separated gaseous product and stream for the external use at a controlled rate which is approximately the amount necessary to the demand of said external use;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

61. The method of Claim 56 wherein:

a) the gaseous ammonia and carbon dioxide formed in step a are separated from the residual liquid phase medium while under the operating pressure in a separation device; and

b) the residual liquid phase medium is recycled from the separation device back into the reactor, or urea dissolver, for further conversion of any unreacted urea, biuret and intermediate ammonium carbamate therein.

62. The method of claim 56, 57, 58, 59 or 60 wherein the demand is for removal of only a portion of the nitrogen oxides.

63. The method of claim 60 in which the hydrolysis reaction is carried out under non-catalytic conditions.

64. The method of Claim 60 in which the reaction rate to form the gaseous ammonia-containing product is enhanced by inclusion in the aqueous solution of a composition which increases the rate of the hydrolysis of urea and is selected from the following:

a) Oxides or ammonium or alkali metal salts or hydroxides of elements in Groups III-B, IV, V and VI-A of the Periodic Chart Of The Elements, or the hydroxides, carbonates or bicarbonates of Group I;

b) Acidic or Basic Ion-exchange resins, and

c) Activated carbon, silica or alumina.

65. The method of claim 56, 57, 58, 59 or 60 wherein the aqueous solution in the reactor is held at an essentially constant volume.

66. The method of Claim 60 wherein said solids content in the reactor is from about 10% to 76% solids.

67. The method of Claim 56, 57, 58, 59 or 60 in which the conditions of operation in the reactor are carried out within the temperature range of about 110°C to about 180°C, pressure range of about 20 PSIG - 500 PSIG, and the residual liquid phase medium contains urea.

68. The method of Claim 67 wherein the residual liquid phase medium is recycled back into the reactor or urea dissolver for further hydrolysis of the urea therein.

69. The method of Claim 60 in which the gaseous ammonia and carbon dioxide product being discharged are maintained at a temperature above 60°C.

70. The method of Claim 60 in which said external use of the ammonia in the product ammonia and carbon dioxide produced is for removing nitrogen oxides from combustion gas streams by SNCR (Selective Non-Catalytic Reduction or SCR (Selective Catalytic Reduction) processes.

71. The method of Claim 60 in which a portion of the water vapor in the ammonia and carbon dioxide product stream leaving the reactor is removed by cooling the product gas stream in a condenser while under pressure.

72. The method of Claim 71 in which the water removed from the gaseous ammonia and carbon dioxide gaseous product stream is recovered and recycled back to the reactor or used to replace water used in the preparation of the urea solution.

73. The method of Claim 71 in which the urea solution is used as the coolant to the condenser, following which the heated solution is delivered to the reactor.

74. The method of Claim 60 in which the pressure within the reactor is monitored and controlled by the gas phase pressure, and gas phase pressure gauge, control valve and connection lines are provided and are heated to above 60°C.

75. The method of Claim 74 in which the pressure within the reactor is monitored and controlled by the liquid phase pressure, the pressure gauge and connection line being at a temperature from ambient to the temperature of the reactor solution.

76. The method of Claim 60 in which an emergency pressure relief valve is connected to a tank containing water, said tank containing sufficient cold water to cool the reactor solution discharge to stop the hydrolysis reaction.

77. The method of Claim 70 in which a reactor discharge control valve is provided and is regulated to provide a controlled flow rate of the gaseous ammonia and carbon dioxide product stream which matches the amount of nitrogen oxides in said combustion gas streams.

78. The method of Claim 60 in which the product ammonia and carbon dioxide gas stream is mixed with a dilution gas, said dilution gas being comprised of air, steam or flue gas, or mixtures thereof, prior to said external use.

79. The method of Claim 68 in which the heat required for the hydrolysis reaction is derived from said hot combustion gas streams.

80. The method of Claim 60 in which the aqueous solution in the reactor is formed by mixing urea with water and feeding the solution to the reactor.

81. In the method adapted to provide a pressurized gas stream useful for an external use in removing nitrogen oxides from a combustion gas stream by SNCR (Selective Non-Catalytic Reduction), or SCR (Selective Catalytic Reduction), the method comprising:

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at temperatures and pressures sufficient to produce a gaseous product stream of ammonia, carbon dioxide and water at a rate sufficient for external use in step d), and a residual liquid phase reaction medium;

b) separating the gaseous product stream at a controlled pressure and flow rate;

c) retaining the liquid phase reaction medium in the reactor for further conversion to gaseous ammonia and carbon dioxide, and/or recycling at least a portion of the reaction medium back into the reactor or a urea dissolver; and

d) withdrawing the gaseous ammonia and carbon dioxide-containing product stream and feeding it for external use at a controlled rate which is approximately the amount necessary to the demand of said external use in removing said nitrogen oxides;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

82. In the method for producing for external use a gaseous ammonia-containing product from urea, or mixtures of urea containing biuret and/or ammonium carbamate, said ammonia-containing product being essentially free of urea,

biuret, or ammonium carbamate, the method comprising;

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at temperatures and pressures sufficient to produce a gaseous product stream of ammonia, carbon dioxide and water at a rate sufficient for external use in step d), and a residual liquid phase reaction medium;

b) separating the gaseous product stream at a controlled pressure and flow rate while maintaining its temperature above 60°C.;

c) retaining the liquid phase reaction medium in the reactor for further conversion to gaseous ammonia and carbon dioxide, and/or recycling at least a portion of the reaction medium back into the reactor or a urea dissolver; and

d) withdrawing the gaseous ammonia containing product stream and feeding it, while maintaining its temperature above 60°C, at a controlled pressure and rate of flow for said external use;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

83. In the method for producing for external use a gaseous ammonia-containing product from urea, or mixtures of urea containing biuret and/or ammonium carbamate, said ammonia-containing product being essentially free of urea, biuret, or ammonium carbamate, the method comprising;

a) establishing in a reactor an aqueous solution of urea or mixtures of urea containing biuret and/or ammonium carbamate, and hydrolyzing the urea therein at

temperatures and pressures sufficient to produce a gaseous product stream of ammonia, carbon dioxide and water at a rate sufficient for external use in step d), and a residual liquid phase medium;

b) separating the gaseous product stream at a controlled pressure and flow rate while maintaining its temperature above 60°C.;

c) retaining the residual liquid phase medium in the reactor for further conversion to gaseous ammonia and carbon dioxide, and/or recycling at least a portion of the reaction liquid phase medium back into the reactor or a urea dissolver; and

d) withdrawing the gaseous ammonia and carbon dioxide-containing product stream and feeding it, while maintaining its temperature above 60°C, for external use at a controlled pressure and controlled rate which is approximately the amount necessary to meet the demand of said external use;

the improvement wherein the ammonia production rate is governed by the concentration of urea in the reactor.

84. The method of claims 54, 55, 81, 82 or 83 wherein pressure in the reactor is within the range of about 20 psig - 500 psig.